OPERATOR CERTIFICATION BASIC MATH SHEET

DO NOT WRITE ON MATH SHEET

♦ Equivalents ♦

1 day = 1440 minutes 1 cubic foot = 7.48 gallons = 27 cubic feet 1 mg/L = 1 ppm1 cubic yard **1 MGD** = 694 gpm1 gallon of water = 8.34 pounds = 2.31 feet of water π (Pi) = 3.14 1 p.s.i.

1 foot of head = 0.43 p.s.i. Radius of circle = diameter ÷ 2 **1 horsepower** = 0.746 kilowatts **Circumference of circle** = π x diameter 1 acre = 43,560 square feet **Temp.** °Centigrade = (°Fahrenheit - 32°) x 0.55

= 5.280 feet1 mile

♦ Area and Volume Formulas ♦

Circles/Cylinders: **Area, sq. ft.** = π x radius, ft. x radius, ft.

Volume, cu. ft. = π x radius, ft. x radius, ft. x height, ft. Volume, cu. ft. = length, ft. x width, ft. x height, ft.

♦ General Formulas ♦

Detention Time, hr. = volume, gal. x 24 hr./day flow, gpd

Velocity, ft./sec. = distance, ft. time, sec.

Velocity, ft./sec. = gpm diameter, in. x diameter, in. x 2.448 (Pipe)

Day's Supply = total chemical in inventory, lbs. average use, lbs./day

Mean or Average = _sum of values or measurements_ number of values or measurements

Filter Backwash Rate, = backwash flow rate, gpm filter surface area, sq.ft. gpm/sq.ft.

Pond Area, acres = avg. width, ft. x avg. length, ft. 43,560 sq. ft./acre

Pond, Population Loading, = population served, persons number of persons/acre pond area, acres

Dose, mg/L = chemical feed, lbs./day flow, MGD x 8.34 lbs./gal. Rectangles:

Area, sq. ft. = length, ft. x width, ft.

Temp. °Fahrenheit = (°Centigrade x 1.8) + 32°F

% Stroke Setting = _required feed, gpd_ x 100 maximum feed, gpd

% Removal = (in - out) x 100 in

Screening Removed = screenings, cu. ft.

\$ Cost Per Day = hp x 0.746 x \$ rate x hours/day

Median = middle value of a group of data

Filtration Rate, = _flow rate, gpm_ gpm/sq.ft. filter surface area, sq. ft.

Weir Overflow Rate, gpd/ft. = flow rate, gpd weir length, ft.

Flow, gpm = volume, gallons time, minutes

chemical feed, lbs. Dose, mg/L = volume, MG x 8.34 lbs./gal.

Chemical Feed, lbs./day = flow, MGD x dose, mg/L x 8.34 lbs./gal.

Chemical Feed, lbs. = volume, MG x dose, mg/L x 8.34 lbs./gal.

Solids Applied, lbs./day = flow, MGD x conc., mg/L x 8.34 lbs./gal.

♦ Chlorine Formulas ♦

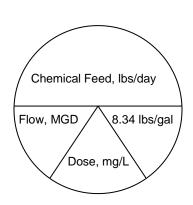
Chlorine Dose, mg/L = chlorine demand, mg/L + chlorine residual, mg/L

Chlorine Residual, mg/L = chlorine dose, mg/L - chlorine demand, mg/L

Chlorine Demand, mg/L = chlorine dose, mg/L - chlorine residual, mg/L

Pounds/Day of HTH = lbs./day chlorine needed % chlorine of HTH

Slope = fall, ft. length, ft.



2018 Basic Math LDH/OPH Operator Certification